

# **VadaTech VT89x (x = 1, 2, 3, 4, 9)**

## **7U Chassis Series**

### ***Product Reference Guide***

September 2014

Version 2.1

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## Revision History

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|--------------|-----------------------------------------------------|----------------|
| 1.0          | Initial release for VT891                           | October 2010   |
| 2.0          | Manual updated with VT892, VT893, VT894 information | November 2013  |
| 2.1          | Manual Updated with VT899 information               | September 2014 |

# Table of Contents

|          |                                                        |           |
|----------|--------------------------------------------------------|-----------|
| <b>1</b> | <b>INTRODUCTION .....</b>                              | <b>8</b>  |
| 1.1      | PURPOSE .....                                          | 8         |
| 1.2      | APPLICABLE PRODUCTS .....                              | 8         |
| 1.3      | DOCUMENT REFERENCES .....                              | 8         |
| 1.3.1    | <i>Specifications</i> .....                            | 8         |
| 1.3.2    | <i>Related Documents</i> .....                         | 8         |
| 1.4      | ACRONYMS USED IN THIS DOCUMENT .....                   | 9         |
| 1.5      | CONVENTIONS USED .....                                 | 10        |
| <b>2</b> | <b>VT89X OVERVIEW .....</b>                            | <b>11</b> |
| 2.1      | PRODUCT COMPARISON .....                               | 11        |
| 2.1.1    | <i>Features</i> .....                                  | 13        |
| 2.1.2    | <i>Custom Options</i> .....                            | 13        |
| 2.2      | ARCHITECTURE .....                                     | 13        |
| 2.3      | COMPATIBLE MODULES .....                               | 15        |
| 2.3.1    | <i>Inclusive Modules</i> .....                         | 15        |
| 2.3.2    | <i>Additional Modules</i> .....                        | 15        |
| <b>3</b> | <b>FUNCTIONAL DESCRIPTION .....</b>                    | <b>16</b> |
| 3.1      | FRONT PANEL .....                                      | 16        |
| 3.1.1    | <i>LEDs</i> .....                                      | 16        |
| 3.2      | COOLING UNITS .....                                    | 16        |
| 3.2.1    | <i>Sensors</i> .....                                   | 17        |
| 3.2.2    | <i>Telco Support and Failover</i> .....                | 18        |
| 3.3      | JTAG SWITCH MODULE (JSM) .....                         | 19        |
| 3.3.1    | <i>JSM Switches</i> .....                              | 19        |
| 3.3.2    | <i>JSM LEDs</i> .....                                  | 19        |
| 3.4      | TELCO ALARM INTERFACE .....                            | 20        |
| 3.4.1    | <i>Telco Alarm Connector</i> .....                     | 21        |
| 3.4.2    | <i>FRU Information</i> .....                           | 22        |
| 3.5      | CLOCK OPTIONS .....                                    | 22        |
| 3.6      | BACKPLANE TOPOLOGY .....                               | 23        |
| 3.6.1    | <i>IPMB Bus</i> .....                                  | 23        |
| 3.6.2    | <i>Fabric A</i> .....                                  | 24        |
| 3.6.3    | <i>Fabric B</i> .....                                  | 25        |
| 3.6.4    | <i>Fabrics D to G</i> .....                            | 26        |
| <b>4</b> | <b>USING THE VT89X .....</b>                           | <b>27</b> |
| 4.1      | CARRIER NUMBER CONFIGURATION .....                     | 27        |
| 4.2      | HOW TO ADD/REMOVE AMC MODULES .....                    | 29        |
| 4.2.1    | <i>Insert a Module</i> .....                           | 29        |
| 4.2.2    | <i>Removing the Module</i> .....                       | 29        |
| 4.3      | ADD/REMOVE 19" MOUNTING BRACKETS .....                 | 30        |
| 4.3.1    | <i>VT891/VT893 and VT894</i> .....                     | 30        |
| 4.3.2    | <i>VT892</i> .....                                     | 31        |
| 4.3.3    | <i>VT899</i> .....                                     | 31        |
| 4.4      | HOW TO REPLACE COOLING UNIT TRAYS AND AIR FILTER ..... | 32        |
| 4.4.1    | <i>Replacing the Cooling Unit Tray</i> .....           | 32        |

4.4.2    *Replacing the Air Filter* ..... 32

**5    MODEL SPECIFIC VARIATIONS.....33**

5.1    VT893 ..... 33

5.2    VT894 ..... 34

5.3    VT899 ..... 35

**CONTACT VADATECH .....38**

TECHNICAL SUPPORT ..... 38

LOCATIONS ..... 38

## Figures

|                                                            |    |
|------------------------------------------------------------|----|
| Figure 1: VT891 Slots Distribution .....                   | 13 |
| Figure 2: VT892 Slot Distribution .....                    | 14 |
| Figure 3: VT893 Slot Distribution .....                    | 14 |
| Figure 4: VT894 Slot Distribution .....                    | 14 |
| Figure 5: VT899 Slot Distribution .....                    | 15 |
| Figure 6: Vadatech JSM - UTC008 .....                      | 19 |
| Figure 7: Telco Alarm Connector .....                      | 21 |
| Figure 8: Non-redundant Clock Topology .....               | 22 |
| Figure 9: Redundant Clock Topology .....                   | 23 |
| Figure 10: IPMB Topology .....                             | 24 |
| Figure 11: Fabric A Topology.....                          | 24 |
| Figure 12: Ports 2 to 3 Direct Connections .....           | 25 |
| Figure 13: Fabric B Topology.....                          | 25 |
| Figure 14: Fabrics D to G Topology .....                   | 26 |
| Figure 15: Chassis Locator Switch .....                    | 27 |
| Figure 16: DA201 Chassis Locator Switch .....              | 28 |
| Figure 17: AMC Hot-swap/Extractor Handle – Side View ..... | 29 |
| Figure 18: VT891 Mounting Brackets.....                    | 30 |
| Figure 19: VT892 Mounting Brackets.....                    | 31 |
| Figure 20: VT899 Mounting Brackets.....                    | 31 |
| Figure 21: CU Tray and Air Filter Screws .....             | 32 |
| Figure 22: VT893 Ports 2-3 Direct Connecitons .....        | 33 |
| Figure 23: VT894 Ports 12-15 and Ports 17-20 Routing.....  | 34 |
| Figure 24: VT899 Ports 12-15 and Ports 17-20 .....         | 35 |
| Figure 26: VT899 Backplane Topology .....                  | 36 |

# Tables

Table 1: Acronyms..... 9

Table 2: Product Comparison 1..... 11

Table 3: Product Comparison 2..... 12

Table 4: IPMI LEDs..... 16

Table 5: Cooling Unit Configuration..... 17

Table 6: Cooling Unit Sensors ..... 17

Table 7: Cooling Unit Additional Sensors ..... 18

Table 8: JSM Slave Select LEDs..... 20

Table 9: JSM Master Select ..... 20

Table 10: Telco Alarm Connector Pinouts..... 21

Table 11: Carrier Number Configuration Reference ..... 28

# 1 Introduction

## 1.1 Purpose

This document describes the VT89x series of chassis based on the MicroTCA specifications. The VT89x series chassis can be used to build fully redundant MicroTCA systems. The main document describes features generic to all chassis in the series, device specific features are described in [Model Specific](#) section.

## 1.2 Applicable Products

- VT891
- VT892
- VT893
- VT894
- VT899

## 1.3 Document References

### 1.3.1 Specifications

The VT89X is compliant with the following specifications:

- *PICMG® 3.0 R3.0 AdvancedTCA Base Specification*
- *PICMG® AMC.0 R2.0 Advanced Mezzanine Card Base Specification*
- *PICMG®  $\mu$ TCA.0 R1.0 Core Specification*

Some of the VT89x products are compliant to other AMC specifications, see [Product Comparison](#) for more details.

### 1.3.2 Related Documents

The following documents provide information related to VT89x:

- *Datasheet for your device*
- *VadaTech MicroTCA MCH Getting Started Guide*
- *VadaTech MicroTCA Shelf Command Line Interface Reference Manual*
- *VadaTech MicroTCA Carrier Command Line Interface Reference Manual*
- *VadaTech MicroTCA Management Interface Specification*
- *VadaTech MicroTCA Carrier SNMP Interface Reference Manual*
- *VadaTech MicroTCA Shelf SNMP Interface Reference Manual*

- *VadaTech MicroTCA PM Command Line Interface Reference Manual*

## 1.4 Acronyms Used in this Document

**Table 1: Acronyms**

| Acronym               | Description                                       |
|-----------------------|---------------------------------------------------|
| AMC                   | Advanced Mezzanine Card                           |
| ATCA                  | Advanced Telecommunication Computing Architecture |
| BSP                   | Board Support Package                             |
| CPU                   | Central Processing Unit                           |
| DDR                   | Double Data Rate                                  |
| DIP                   | Dual In-line Package                              |
| ECC                   | Error Correction Coding                           |
| EMMC                  | Enhanced Module Management Controller             |
| FRU                   | Field Replaceable Unit                            |
| GB                    | Gigabyte                                          |
| GbE                   | Gigabit Ethernet                                  |
| GHz                   | Gigahertz                                         |
| GND                   | Ground                                            |
| IPMB                  | Intelligent Platform Management Bus               |
| IPMI                  | Intelligent Platform Management Interface         |
| JTAG                  | Joint Test Action Group                           |
| JSM                   | JTAG Switch Module                                |
| LED                   | Light Emitting Diode                              |
| MHz                   | Megahertz                                         |
| MicroTCA or $\mu$ TCA | Micro Telecommunications Computing Architecture   |
| MMC                   | Module Management Controller                      |
| PCIe                  | Peripheral Component Interconnect Express         |
| PICMG                 | PCI Industrial Computer Manufacturers Group       |
| PrAMC                 | Processor Advanced Mezzanine Card                 |
| SCP                   | Secure Copy Protocol/Program                      |
| SSH                   | Secure Shell Protocol                             |
| SDR                   | Sensor Data Record                                |
| SerDes                | Serializer-Deserializer                           |
| USB                   | Universal Serial Bus                              |
| XAUI                  | 10 Gigabit Media Independent Interface            |

## 1.5 Conventions Used

The following conventions are used in this document:



Important information, when ignored can cause serious damage to the user or the device is described using this symbol



Important information useful to the reader is described next to this symbol

## 2 VT89x Overview

The VT89x series are 19" x 7U x 10.5" deep (12" deep with handles) MicroTCA chassis offering various options for shelves, MCH AMC, power modules and cooling types. The VT89x series supports up to 12 AMCs and all the models supports full redundancy with dual MCH, dual power modules and dual cooling unit options (on VT899 only dual cooling units are available).

### 2.1 Product Comparison

Table 2 provides a comparison for various features of the VT89x series.

**Table 2: Product Comparison 1**

| Features                                          | VT891                      | VT892                                                                | VT893                                                                     | VT894                                                                |
|---------------------------------------------------|----------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|
| AMC Slots                                         | 12 Full-size               | 12 Full-size                                                         | 11 Full-size                                                              | 12 Full-size                                                         |
| MCH Slots                                         | 2                          | 2                                                                    | 2                                                                         | 2                                                                    |
| PM Slots                                          | 2                          | 2                                                                    | 2                                                                         | 2                                                                    |
| Cooling Type                                      | Front to back              | Bottom to top                                                        | Front to back                                                             | Front to Back                                                        |
| Power                                             | 1000 W power supply        | 1000 W power supply                                                  | 1000 W power supply                                                       | 1000 W power supply                                                  |
| Specifications                                    | AMC.1, .2, .3, .4          | AMC.1, .2, .3, .4                                                    | AMC.1, .2, .3, .4                                                         | AMC.1, .2, .3, .4                                                    |
| Full Redundancy (Dual MCHs, PMs, Intelligent CUs) | Yes                        | Yes                                                                  | Yes                                                                       | Yes                                                                  |
| Ports 2-3 Direct Connections                      | Optional                   | Optional                                                             | Optional                                                                  | Optional                                                             |
| Redundant Clocks                                  | Optional                   |                                                                      | Optional                                                                  | Optional                                                             |
| JSM                                               | To be purchased separately | To be purchased separately                                           | To be purchased separately                                                | To be purchased separately                                           |
| Telco Alarm                                       | Yes                        | Yes                                                                  | Yes                                                                       | Yes                                                                  |
| Others                                            | Fabric clock to each AMC   | Fabric Clock on FCLK<br>Telco Clock on TCLKA, TCLKB, TCLKC and TCLKD | Telco/GPS Clock on TCLKA, TCLKB, TCLKC and TCLKD and Fabric Clock on FCLK | Fabric Clock on FCLK<br>Telco Clock on TCLKA, TCLKB, TCLKC and TCLKD |

*Table 3: Product Comparison 2*

| Features                                                | VT899                                                     |
|---------------------------------------------------------|-----------------------------------------------------------|
| AMC Slots                                               | 6 Full-size, modules or<br>3 Full-size, double<br>modules |
| MCH Slots                                               | 1                                                         |
| PM Slots                                                | 1                                                         |
| Cooling Type                                            | Front to Back                                             |
| Power                                                   | 500 W power supply                                        |
| Specifications                                          | AMC.1, .2, .3, .4                                         |
| Full Redundancy<br>(Dual MCHs, PMs,<br>Intelligent CUs) | Redundant Cooling<br>Units only                           |
| Ports 2-3 Direct<br>Connections                         | Optional                                                  |
| Redundant Clocks                                        | Optional                                                  |
| JSM                                                     | Optional                                                  |
| Telco Alarm                                             | Yes                                                       |
| Others                                                  | Fabric clock to each<br>AMC                               |

## 2.1.1 Features

- Clocks: CLK1, CLK2 and CLK3 available to each slots. CLK3 can be configured either as a Fabric clock or as a Telco clock.
- 1000 W AC supply option (500 W on VT899)
- Radial I2C bus to each AMC
- High speed routing on 34 layers with back drilled routing for higher performance and signal integrity
- High speed MicroTCA connectors (12.5 GHz), allowing for 40G fabric interfaces
- Redundant FRU information
- Redundant carrier locator
- Telco Alarms
- No active components on the backplane for ease of serviceability
- ESD jack on front side of chassis, location dependant on model.
- JTAG Switch Module (JSM) slot
- RoHS compliant

## 2.1.2 Custom Options

You can customize the VT89x such as temperature range, conformal coating, management software type, inclusive JSM and telco alarms, etc. To select the appropriate product to meet your specific requirements, refer to the ordering options section of the datasheet for your product.

## 2.2 Architecture

The VT89x series supports various configurations of module slots.

Figure 1: VT891 Slots Distribution

|     |       |       |       |       |       |       |       |       |       |       |        |        |        |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| PM2 | JSM   |       |       |       |       |       | MCH 2 |       |       |       |        |        |        |
| PM1 | AMC 1 | AMC 2 | AMC 3 | AMC 4 | AMC 5 | AMC 6 | MCH 1 | AMC 7 | AMC 8 | AMC 9 | AMC 10 | AMC 11 | AMC 12 |

Figure 2: VT892 Slot Distribution

|        |       |
|--------|-------|
| PM1    | PM2   |
| AMC 1  | JSM   |
| AMC 2  |       |
| AMC 3  |       |
| AMC 4  |       |
| AMC 5  |       |
| AMC 6  |       |
| MCH 1  | MCH 2 |
| AMC 7  |       |
| AMC 8  |       |
| AMC 9  |       |
| AMC 10 |       |
| AMC 11 |       |
| AMC 12 |       |

Figure 3: VT893 Slot Distribution

|       |     |
|-------|-----|
| PM1   | PM2 |
| AMC1  |     |
| AMC2  |     |
| AMC3  |     |
| AMC4  |     |
| AMC5  |     |
| MCH1  | JSM |
| MCH2  |     |
| AMC6  |     |
| AMC7  |     |
| AMC8  |     |
| AMC9  |     |
| AMC10 |     |
| AMC11 |     |

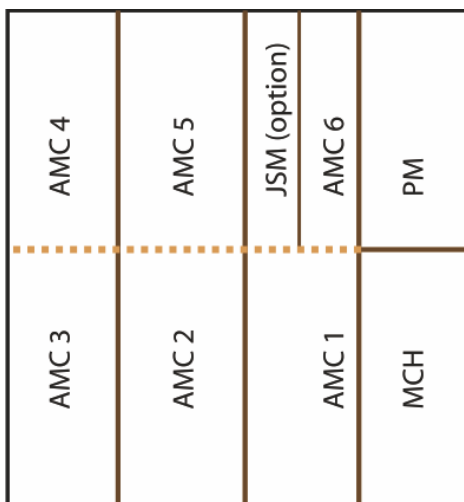
Figure 4: VT894 Slot Distribution

|        |       |
|--------|-------|
| PM1    | PM2   |
| AMC 1  | JSM   |
| AMC 2  |       |
| AMC 3  |       |
| AMC 4  |       |
| AMC 5  |       |
| AMC 6  |       |
| MCH 1  | MCH 2 |
| AMC 7  |       |
| AMC 8  |       |
| AMC 9  |       |
| AMC 10 |       |
| AMC 11 |       |
| AMC 12 |       |



*For VT891, VT892 and VT894, when the JSM module is used, only single width AMC can be used in AMC slot 1*

Figure 5: VT899 Slot Distribution



## 2.3 Compatible Modules

### 2.3.1 Inclusive Modules

The following modules are shipped with the VT89x series chassis.

- Cooling Units – VT89x series chassis uses two VadaTech VT095 cooling units, in redundant configuration.
- Telco Alarm – VT89x series use a VadaTech DA200 telco alarm modules

### 2.3.2 Additional Modules

The following modules can be used with the VT89x series and must be purchased separately.

Power supply – An optional power supply that supplies –48 V, 1000 W power to the power modules can be used with a VT89x chassis, 500W for VT899. Refer to the datasheet for your device, for more information on power supply ordering option.

- JSM – VT89x series can be used with UTC008 JTAG Switch Modules.
- MCH – VT89x series chassis allows up to two MCHs, in redundant configuration. Any VadaTech or third party MCHs can be used with a VT89x chassis.
- AMC – VT89x series will work with any AMC 0 compliant AMC

## 3 Functional Description

### 3.1 Front Panel

#### 3.1.1 LEDs

##### 3.1.1.1 IPMI LEDs

The IPMI LEDs follow AMC specifications. The colors and meanings of the IPMI LEDs are described in [Table 4](#). The IPMI LEDs are found on all removable Field Replaceable Units (FRU) such as an AMC, Power Module or Cooling Unit.

*Table 4: IPMI LEDs*

| Name     | Color | Description                                                                                                                                                                   |
|----------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hot Swap | Blue  | Indicates the hot-swap state, per PICMG 3.1 specification.<br>OFF: Module active<br>ON: OK to remove the module<br>BLINKING: Hot-swap/power transition in progress            |
| Fail     | Red   | OFF: No fault<br>ON: Non-recoverable fault, indicates that the IPMC has not detected a good power.<br>BLINKING: Recoverable fault                                             |
| OK       | Green | OFF: No payload power<br>ON indicates that the IPMC has enabled power and payload power OK.<br>BLINKING: Payload power OK, but held in reset (e-keying in process or failure) |
| Upgrade  | Amber | OFF: Normal<br>BLINKING: Firmware, SDR, or FRU upgrade is in progress                                                                                                         |

##### 3.1.1.2 Other LEDs

VT89x series chassis front panel have other LEDs that are provide status information of various ports and sub-modules of the chassis. These LEDs are labelled on the front panel and self-explanatory.

### 3.2 Cooling Units

The VT89x series chassis can be used with two VT095 cooling units,( VT899 chassis uses two VT090 Cooling Units.) in redundant configuration. [Table 5](#) provides information about the cooling units used in a VT89x chassis.

**Table 5: Cooling Unit Configuration**

| Position | Name | Power Channel | IPMB Address | FRU ID |
|----------|------|---------------|--------------|--------|
| Bottom   | CU1  | 3             | 0xA8         | 40     |
| Top      | CU2  | 4             | 0xAA         | 41     |

The bottom cooling unit is considered as the air intake unit and the top unit considered as the air exhaust unit. A chassis air filter is located underneath the bottom unit.

At power-up, the hot swap handle state is closed. Pushing the Hot-swap button once toggles the handle state to open. Pushing the Hot-swap button again toggles the handle state to Closed.

The cooling unit tray overlay provide labels to indicate the physical location of the front side modules such as AMCs, MCH and Power Modules.

### 3.2.1 Sensors

The VT095 contains several sensors which are monitored by the carrier manager on the primary MCH used in the VT89x chassis. The following sensors are available with a VT095.

**Table 6: Cooling Unit Sensors**

| Type | Name          | Description                       |
|------|---------------|-----------------------------------|
| 0x01 | CU T1         | Cooling unit temperature sensor   |
| 0x04 | FAN1 RPM      | Fan speed sensor                  |
| 0x04 | FAN2 RPM      | Fan speed sensor                  |
| 0x04 | FAN3 RPM      | Fan speed sensor                  |
| 0x04 | FAN4 RPM      | Fan speed sensor                  |
| 0x04 | FAN5 RPM      | Fan speed sensor                  |
| 0x01 | CU T2         | Fan controller temperature sensor |
| 0x01 | CU T3         | Cooling unit temperature sensor   |
| 0x01 | CU T4         | Cooling unit temperature sensor   |
| 0xF2 | VT89x CU HS   | Hot swap handle status            |
| 0xF1 | VT89x CU IPMB | IPMB-0 Status                     |

#### 3.2.1.1 Temperature Sensors

Each VT095 includes 4 temperature sensors to monitor the operating conditions.

- T1, T3 and T4 are distributed on the fan tray
- T2 monitors the internal temperature of the fan motor controller

The temperature sensors monitor the air temperature and the temperature difference between the air intake and exhaust air provides information about the amount of heat dissipated by the chassis. The

temperature sensors T1, T3 and T4, distributed along the fan trays, indicate the hot and cold zones within the chassis.

The default operating conditions for the temperature sensors are:

- Lower non recoverable limit =  $-5^{\circ}\text{C}$
- Upper non critical limit =  $+65^{\circ}\text{C}$
- Upper critical limit =  $+80^{\circ}\text{C}$



*The default sensor limits can be updated by using the ScorpionWare™ system manager software but the updated values will be cleared on power cycle*

The CU that provides the Telco function supports these additional sensors: Only one of the cooling units can manage the telco alarm

**Table 7: Cooling Unit Additional Sensors**

| Type | Name          | Description                |
|------|---------------|----------------------------|
| 0xE2 | POWER SWITCH  | Status of power switch     |
| 0xE1 | AIR FILTER PS | Air filter presence sensor |
| 0xD7 | TELCO ACTIVE  | Telco alarm active status  |
| 0xF4 | TELCO ALARM   | Telco alarm status sensor  |

### 3.2.1.2 Air Filter Present Sensor

An optical sensor on the fan tray located in the bottom slot detects the presence/removal of the air intake filter. When there is no filter present, the sensor detects this and creates a major alarm event. When the user issues a “get\_diagnostics” command, the major alarm event will list the output and the major alarm indicator will turn ON.

### 3.2.1.3 Telco Active Sensor

The telco active sensor determines which cooling unit (when two CU are used) is in control of the telco alarm. A dedicated LED on the Telco Alarm front panel indicates which cooling unit is active.

### 3.2.1.4 Power Switch Sensor

The cooling unit controlling the telco alarm monitors the chassis power switch. The power switch can be used as a soft-shutdown to safely power the chassis.

## 3.2.2 Telco Support and Failover

Either cooling units (CU) can act as the Telco Device for the Carrier, but only one cooling unit will be the active telco device. The active CU will respond to Telco requests from the Carrier, and will include the TELCO STATUS sensor record in its SDR. If the active CU is removed, the other CU will become

active and will act as the Telco Device. The MicroTCA specifications does not cover redundant Telco Devices, so third-party Carrier Managers may not support this failover behavior.

### 3.3 JTAG Switch Module (JSM)

The VT89x chassis that provide an optional JTAG Switch Module (JSM) provides JTAG support to all JTAG-capable Modules in the system. The front connector is a standard 0.1 header which mates to most JTAG modules. There are three arbitrated master ports (2 MCH and one front/rear connector). The secondary ports are auto-detected if they are present. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50 MHz.

Figure 6: Vadatech JSM - UTC008



#### 3.3.1 JSM Switches

- The FTM REQ switch is used to request JTAG master access for the front connector.
- The CFG switch allows configuration of the JTAG switch to occur through the front connector.
- The RST switch resets the JTAG switch

#### 3.3.2 JSM LEDs

The ACT LED indicates that the JSM is active. The Slave Select LEDs indicate which secondary port is selected. If no LEDs are on, no secondary port is selected. Otherwise, add the numbers next to the illuminated LEDs together and use the values shown in [Table 8](#).

**Table 8: JSM Slave Select LEDs**

| Number | JTAG Target |
|--------|-------------|
| 1      | AMC 1       |
| 2      | AMC 2       |
| 3      | AMC3        |
| 4      | AMC 4       |
| 5      | AMC 6       |
| 6      | AMC 7       |
| 7      | AMC 8       |
| 8      | AMC 9       |
| 9      | AMC 10      |
| 10     | AMC 11      |
| 11     | AMC 12      |
| 12     | CU1         |
| 13     | CU2         |
| 14     | PM1         |
| 15     | PM2         |

The MGNT LEDs indicate which master is currently granted access. If no LEDs are ON, no master has access.

**Table 9: JSM Master Select**

| LED | JTAG Master                   |
|-----|-------------------------------|
| 0   | Front panel or rear connector |
| 1   | MCH 1                         |
| 2   | MCH 2                         |

The DPDV LED directly indicates the state of the DPDV bit in the Device Configuration Register.

For more information on detailed configuration of JSM, [refer to the UTC007/8 User Manual](#).



*Depending on the chassis model selected, installing a JSM module may limit the use of double width AMC in slot 1.*

## 3.4 Telco Alarm Interface

The VT89x chassis that provides an optional Telco Alarm Interface connector is used to relay alarm information to an external alarm device. DA200 is used as a telco interface in the VT89x series.

- The “Active 1” and “Active 2” LEDs indicate which Cooling Unit is representing the Telco device to the Carrier Manager. Normally, “Active 1” will be on, indicating that the lower CU is active.

- The Critical, Major, and Minor Alarm LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The Chassis Power Switch is used to send a “Chassis Control” request to the Carrier Manager. This will cause a controlled power-down (or power-up) of all FRUs in the Carrier.
- The Power Button LED (red) is on when the Chassis Power Switch is set to OFF.
- The Power Good LED reflects the power state of the DA200.
- The Telco Alarm Cutoff button is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the **Set Telco Alarm State** ATCA Command. When disengaged, the external Telco alarms will turn back on.

### 3.4.1 Telco Alarm Connector

A micro DSUB-15 male connector is used to drive an external alarm device.

*Figure 7: Telco Alarm Connector*

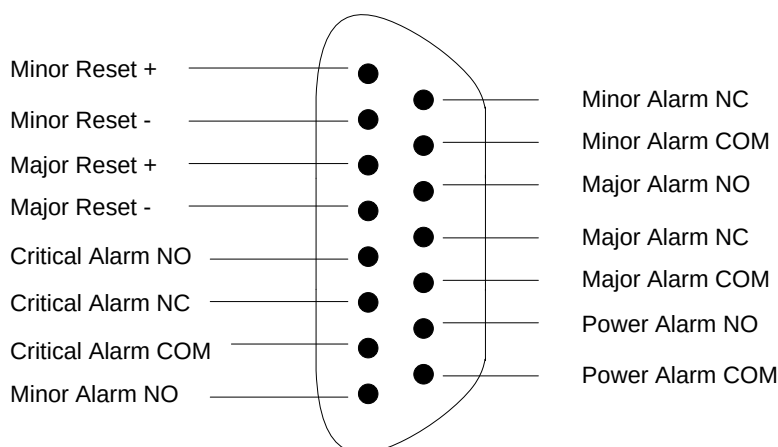


*Table 10: Telco Alarm Connector Pinouts*

| Pin Name           | Description                           |
|--------------------|---------------------------------------|
| Minor Reset +      | Minor alarm reset, positive polarity  |
| Minor Reset -      | Minor alarm reset, negative polarity  |
| Major Reset +      | Major alarm reset, positive polarity  |
| Major Reset -      | Major alarm reset, negative polarity  |
| Critical Alarm NO  | Critical alarm relay, normally open   |
| Critical Alarm NC  | Critical alarm relay, normally closed |
| Critical Alarm COM | Critical alarm relay, common path     |
| Minor Alarm NO     | Minor alarm relay, normally open      |
| Minor Alarm NC     | Minor alarm relay, normally closed    |
| Minor Alarm COM    | Minor alarm relay, common path        |
| Major Alarm NO     | Major alarm relay, normally open      |

| Pin Name        | Description                        |
|-----------------|------------------------------------|
| Major Alarm NC  | Major alarm relay, normally closed |
| Major Alarm COM | Major alarm relay, common path     |
| Power Alarm NO  | Power alarm relay, normally open   |
| Power Alarm COM | Power alarm relay, common path     |

### 3.4.2 FRU Information

FRU information describes the carrier backplane topology to the chassis MCH controllers. The information is typically held in an EPROM attached to the chassis Telco board or attached to the chassis backplane. In VT89x series, the FRU information is located on the telco alarm module.



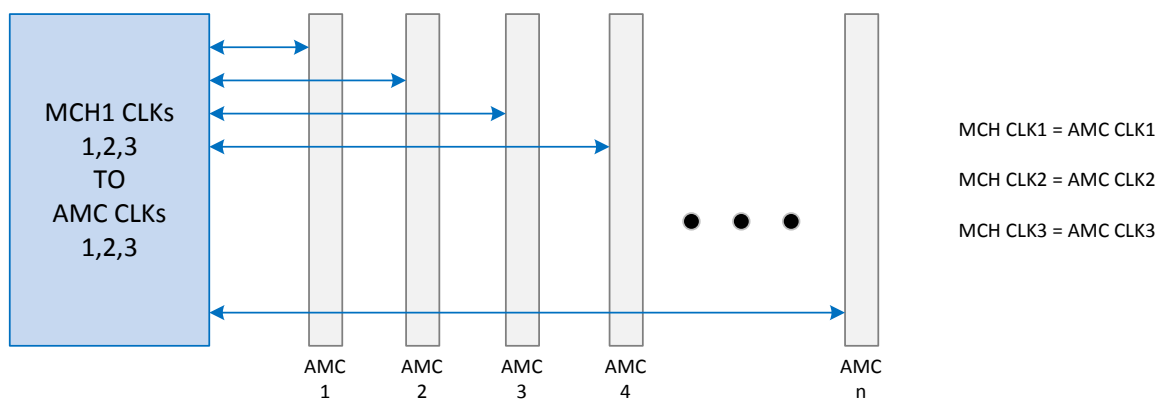
*The Carrier FRU information is stored in the EEPROM at address 0x52*

## 3.5 Clock Options

The VT89x series provide non-redundant clock networks connecting MCH clocks CLK1, CLK2 and CLK3 to the AMC clocks CLK1, CLK2 and CLK3 using a dedicated line as shown in [Figure 8](#).

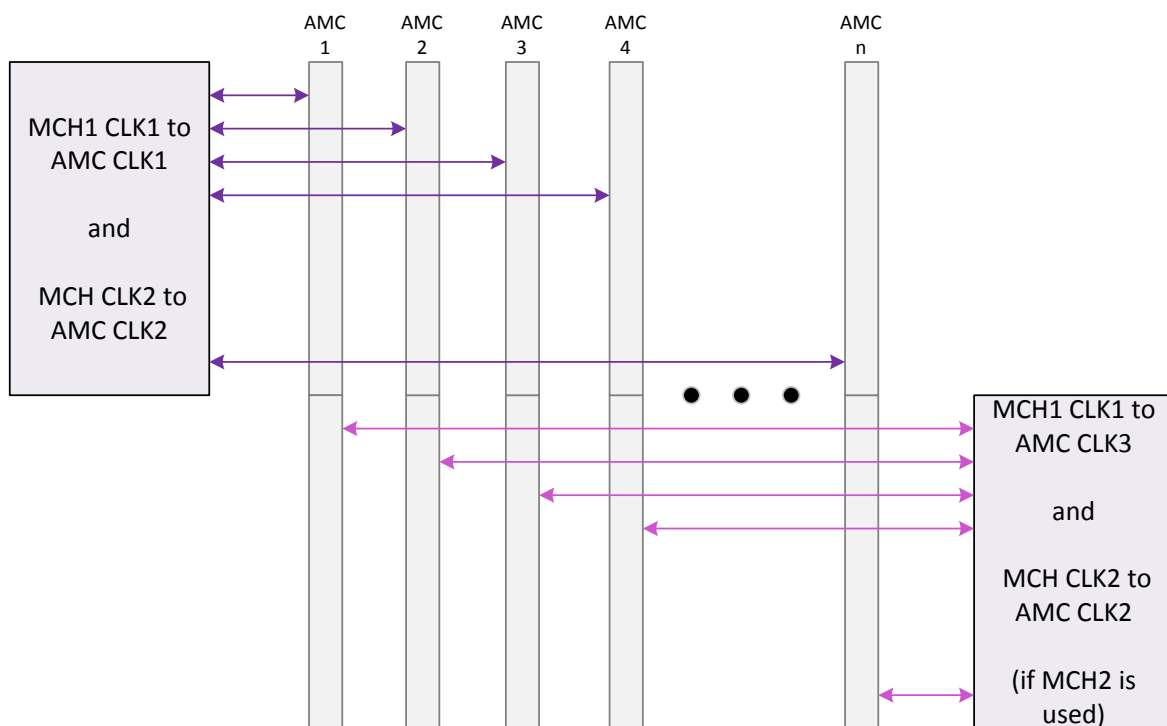
CLK3 can be assigned as a Telco clock or a Fabric clock as per AMC.1 specification. Fabric B will be partially provided on ports 1 – 6 and CLK3 is routed to Fabric B on ports 7 – 12.

**Figure 8: Non-redundant Clock Topology**



In redundant configuration CLK1 of MCH1 is connected (point-to-point) to each AMC CLK1 and CLK1 of MCH2 is connected (point-to-point) to each AMC CLK3, as shown in [Figure 9](#).

Figure 9: Redundant Clock Topology



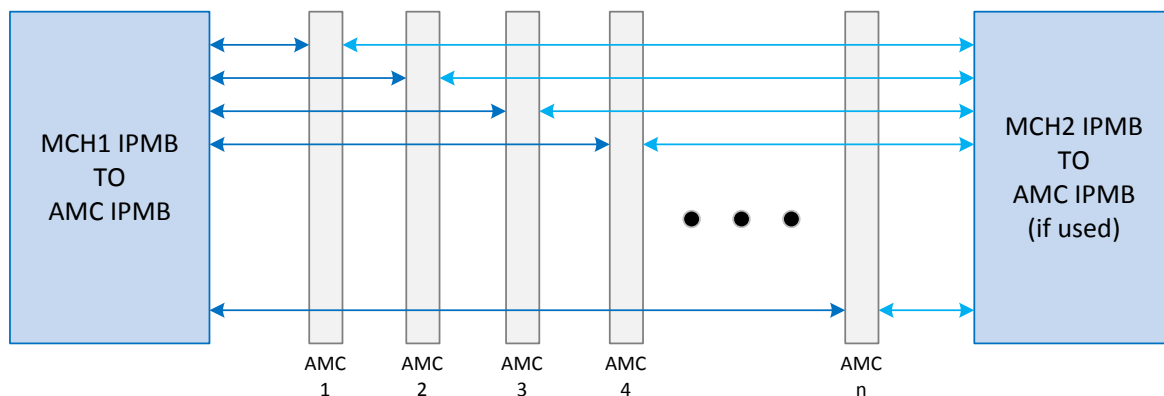
## 3.6 Backplane Topology

The generic backplane topology, common to VT89x series, is described in this section, see [Model Specific](#) for any model specific variations. Depending on the clock options selected, some fabrics may not be routed.

### 3.6.1 IPMB Bus

The VT89x provides a dual-redundant IPMB-0 bus among the MCH1, MCH2, CU1, CU2, PM1, and PM2 modules. The IPMB-L is a radial dual-star with each MCH connected to all AMCs using the I2C bus as shown in [Figure 10](#).

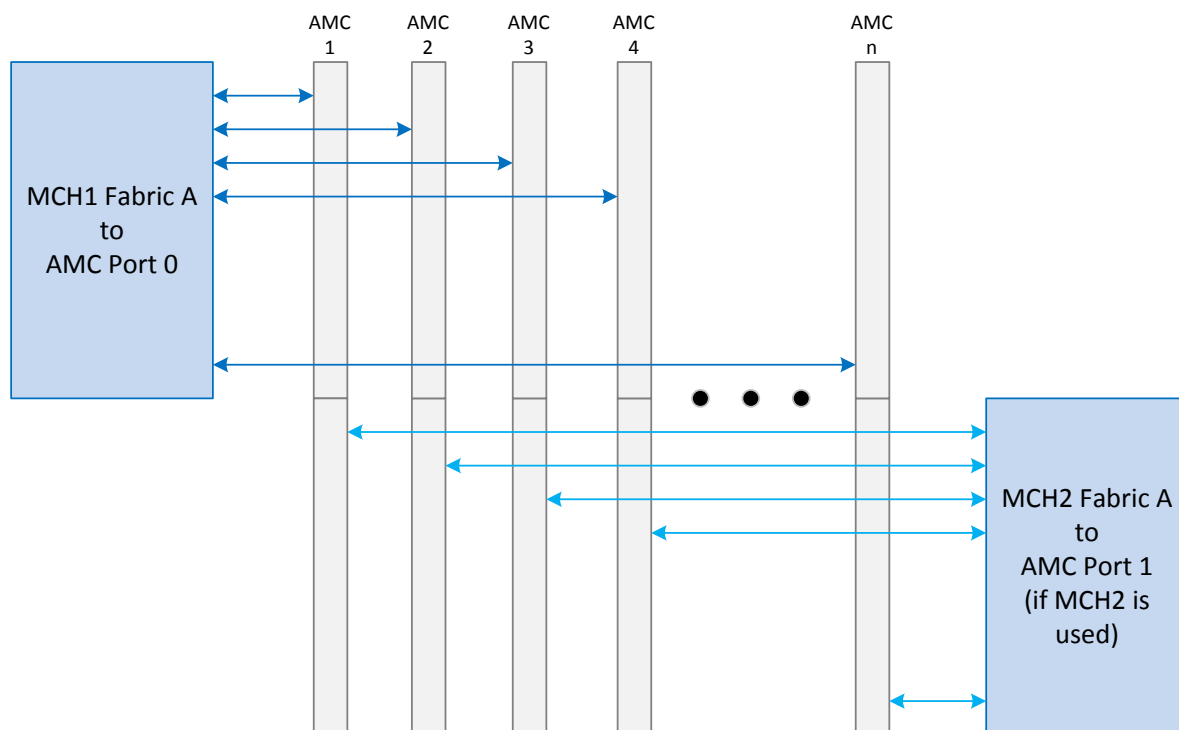
Figure 10: IPMB Topology



### 3.6.2 Fabric A

Fabric A from MCH1 is connected to port 0 of each AMC and Fabric A from MCH2 is connected to port 1 of each AMC as shown in Figure 11.

Figure 11: Fabric A Topology

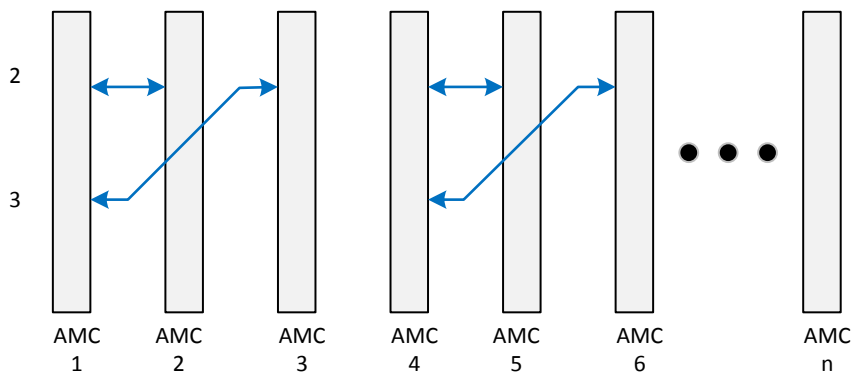


### 3.6.3 Fabric B

AMC ports 2 and 3 (SAS / SATA) are routed depending on the selected ordering option. For option (B=1), AMCs are connected directly together.

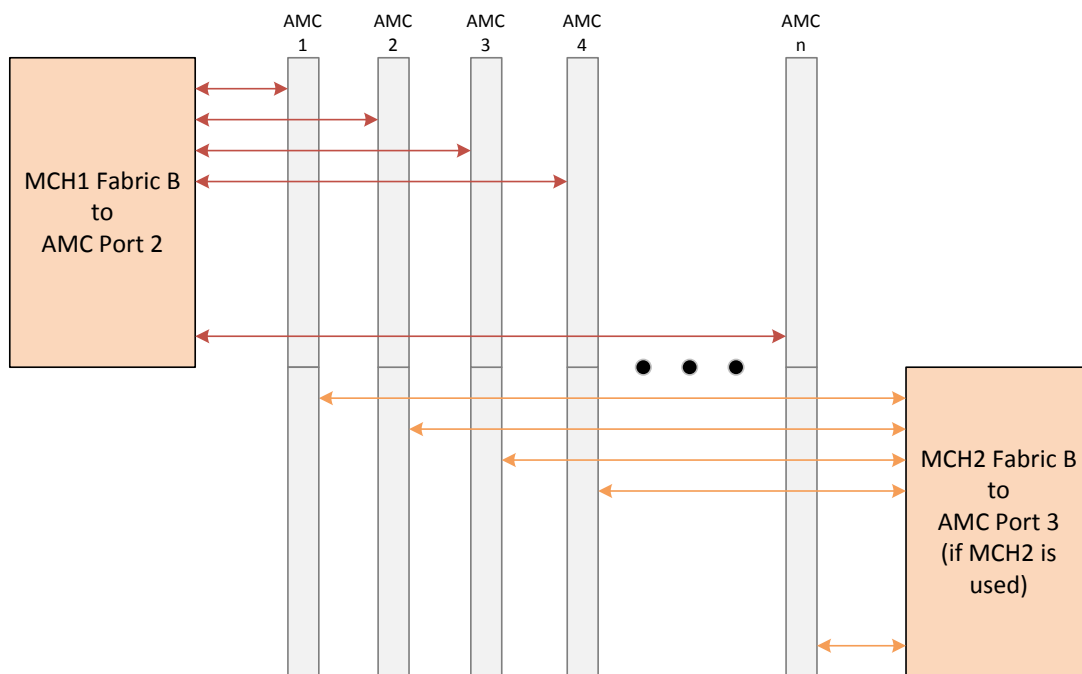
The AMC ports 2 and 3 are interconnected with ordering option B=1, as shown in [Figure 12](#).

**Figure 12: Ports 2 to 3 Direct Connections**



For option (B=2), MCH1 Fabric B is connected to AMC port 2 of all AMCs, and MCH2 Fabric B is connected to AMC port 3 as shown in [Figure 13](#).

**Figure 13: Fabric B Topology**

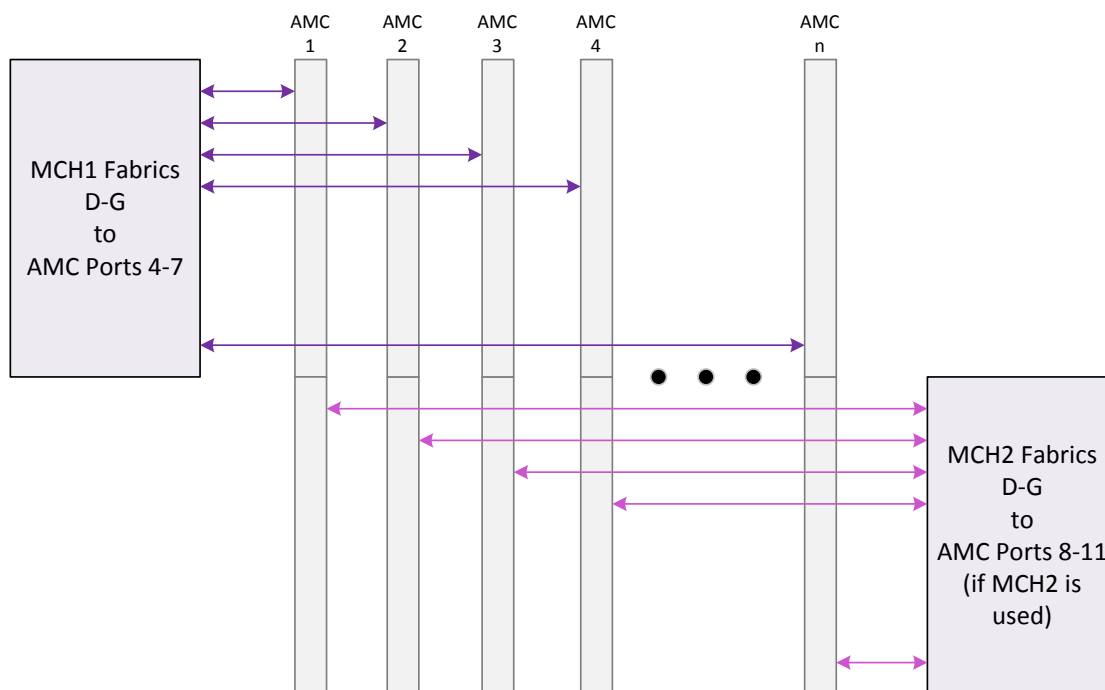


Port 2 and 3 configuration is denoted by “B” of the part number, refer to the “Ordering Options” section of the datasheet, for more information.

### 3.6.4 Fabrics D to G

In the fat pipes region, MCH1 Fabrics D, E, F, and G are connected to ports 4, 5, 6, and 7, respectively, on all AMCs. MCH2 Fabrics D, E, F, and G are connected to ports 8, 9, 10, and 11 respectively, on all AMCs as shown in Figure 14.

Figure 14: Fabrics D to G Topology



## 4 Using the VT89x

### 4.1 Carrier Number Configuration

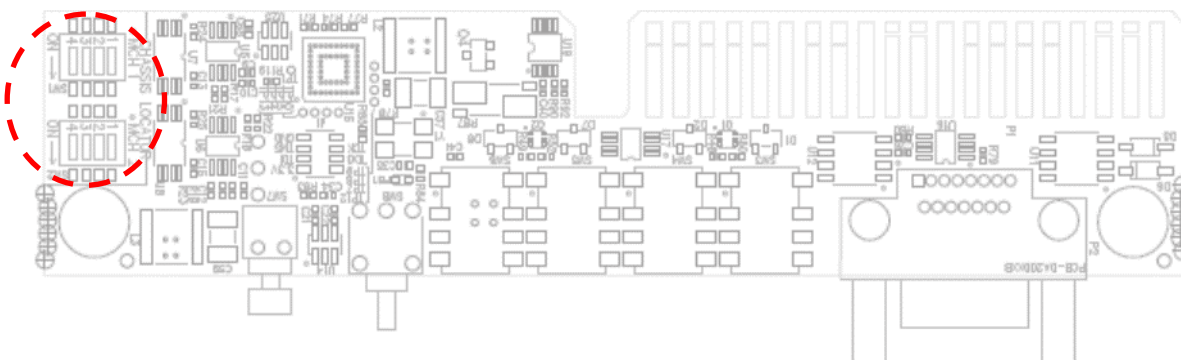
If multiple Carriers are configured with an external Shelf Manager, make sure that each Carrier has a unique Carrier number. The carrier number provides a unique address to each carrier for easy management by shelf/system managers.

VT89x chassis use DA200 as the Telco module, except for VT899 as it uses a DA201 module.

To set the carrier number, set the Chassis Locator, shown in [Figure 15](#), set the switches on DA200 according to the configuration provided in [Table 11](#).

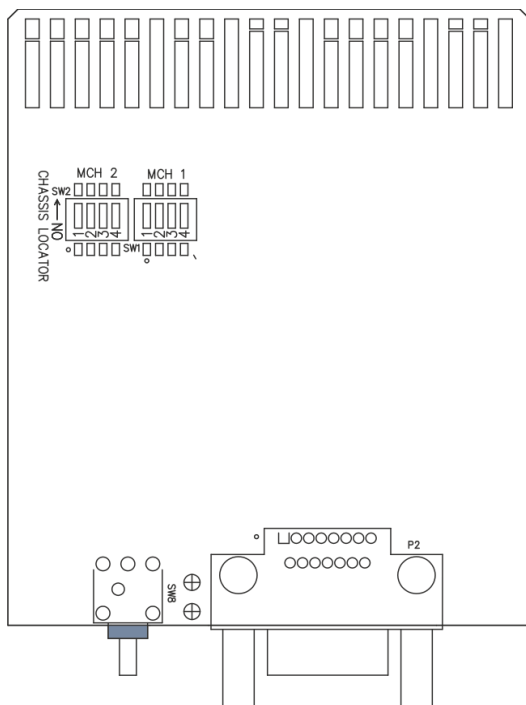
Make sure both the switches are set the same. The Chassis Locator switches are on the top side of the DA200 as shown (in red circle) in [Figure 15](#).

*Figure 15: Chassis Locator Switch*



The chassis locator switch on DA201 is shown in [Figure 16](#).

Figure 16: DA201 Chassis Locator Switch



*Special attention should be paid whilst removal and re-installation of the telco alarm module, since the edge connectors on the telco alarm module should line up correctly with the backplane. Improper alignment and excessive force could damage the edge connector and also cause serious damage to the chassis backplane*

Table 11: Carrier Number Configuration Reference

| Carrier Number | Switch 1 | Switch 2 | Switch 3 | Switch 4 |
|----------------|----------|----------|----------|----------|
| 1              | ON       | ON       | ON       | ON       |
| 2              | ON       | ON       | ON       | OFF      |
| 3              | ON       | ON       | OFF      | ON       |
| 4              | ON       | ON       | OFF      | OFF      |
| 5              | ON       | OFF      | ON       | ON       |
| 6              | ON       | OFF      | ON       | OFF      |
| 7              | ON       | OFF      | OFF      | ON       |
| 8              | ON       | OFF      | OFF      | OFF      |
| 9              | OFF      | ON       | ON       | ON       |
| 10             | OFF      | ON       | ON       | OFF      |
| 11             | OFF      | ON       | OFF      | ON       |
| 12             | OFF      | ON       | OFF      | OFF      |
| 13             | OFF      | OFF      | ON       | ON       |
| 14             | OFF      | OFF      | ON       | OFF      |
| 15             | OFF      | OFF      | OFF      | ON       |
| 16             | OFF      | OFF      | OFF      | OFF      |

The Carrier number can also be set through the Carrier Manager CLI **set\_carrier\_number** command. The Carrier Number set through the CLI takes precedence over the Carrier number set in the Chassis Locator switch

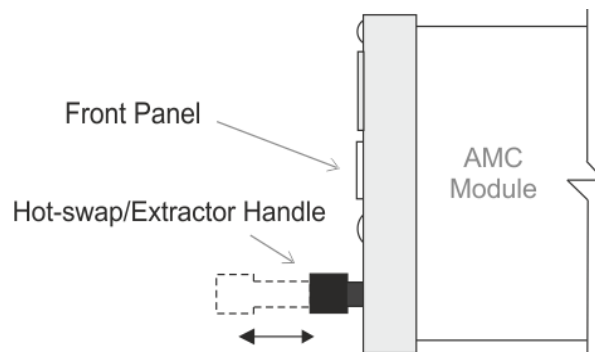
## 4.2 How to Add/Remove AMC Modules



*The module should only be removed from a running carrier when the AMC Blue LED is solid ON. Removing the module before the blue LED is on may cause severe damage to the device.*

---

Figure 17: AMC Hot-swap/Extractor Handle – Side View



### 4.2.1 Insert a Module

To insert a new field replaceable module, such as an AMC, into the chassis:

1. Pull out the hot-swap handle until it stops
2. Insert the module into the chassis guide rails making sure the hot swap handle is towards the lower side of the chassis (chassis with vertical slots only) and push the front panel firmly until it is fully seated into the connector. If the card does not go fully in, do not force it and instead remove it and check for proper orientation or obstructions.
3. Once fully inserted the Blue LED should go to solid ON.
4. Push in the handle to latch the module into the chassis, the Blue LED should blink for a short duration and then goes to solid OFF and the green LED would be expected to be solid ON to indicate that the payload power was applied.

### 4.2.2 Removing the Module

To remove a module such as an AMC:

1. Pull out the hot-swap handle until it stops (but do not pull hard enough to remove the module itself yet).

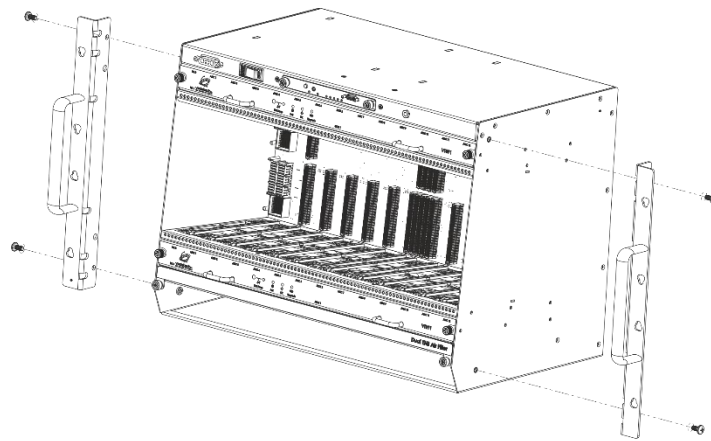
2. The Blue LED should blink for a short duration and then go solid ON.
3. Once the blue LED is ON, pull the hot-swap handle straight out firmly to remove the module from the chassis

## 4.3 Add/Remove 19" Mounting Brackets

This section describes how to install 19" mounting brackets for various VT89x chassis.

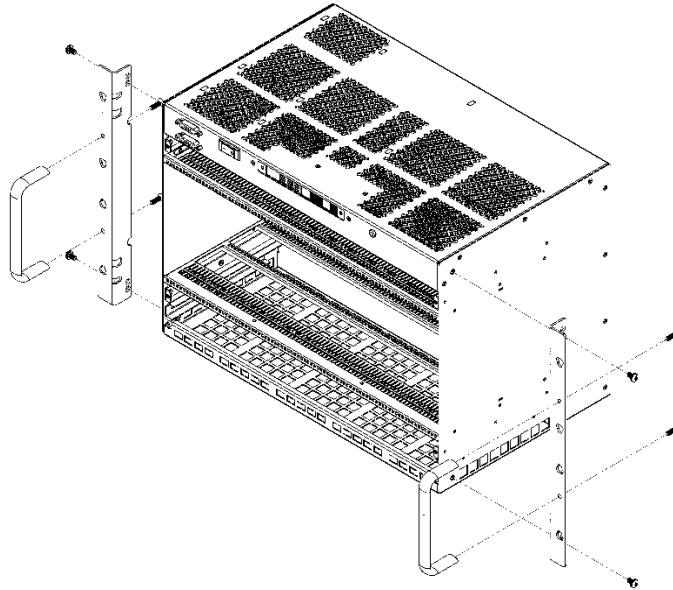
### 4.3.1 VT891/VT893 and VT894

*Figure 18: VT891 Mounting Brackets*



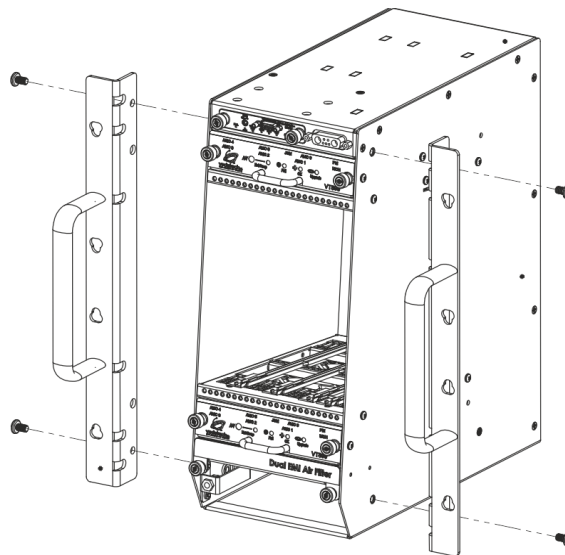
### 4.3.2 VT892

*Figure 19: VT892 Mounting Brackets*



### 4.3.3 VT899

*Figure 20: VT899 Mounting Brackets*

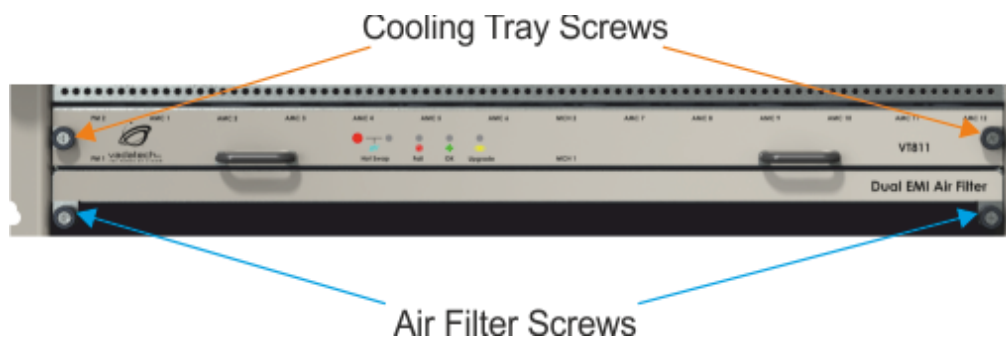


## 4.4 How to Replace Cooling Unit Trays and Air Filter

The Cooling Units and Air Filter are hot-swappable but it is recommended to do so when system is off since:

- When replacing a CU, the system's air flow will be reduced or removed and could make payloads to overheat.
- When replacing the air filter, the system may push in dust particles that will compromise fan life span and overall system cleanliness.

Figure 21: CU Tray and Air Filter Screws



### 4.4.1 Replacing the Cooling Unit Tray

1. Shutdown the system, if running
2. Make sure power to the device is switched off
3. Remove the screws (orange arrows) shown in [Figure 21](#).
4. Pull the cooling Tray
5. Insert the new cooling unit into the slot
6. Secure the cooling unit trays with the screws

### 4.4.2 Replacing the Air Filter

1. Shutdown the system, if running
2. Make sure power to the device is switched off
3. Remove the screws (blue arrows) shown in [Figure 21](#).
4. Pull the air filter
5. Insert the new air filter into the slot
6. Secure the air filter with the screws

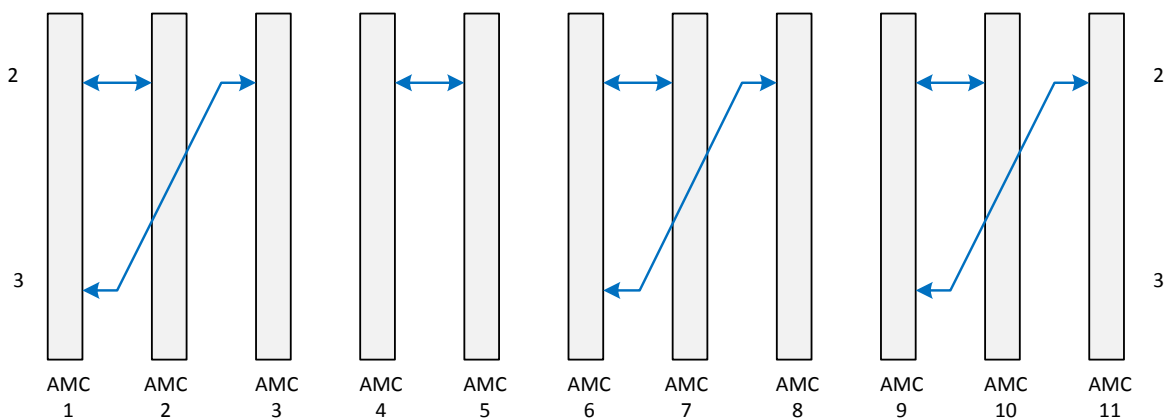
## 5 Model Specific Variations

This section provides information specific to the individual chassis of the VT89x series.

### 5.1 VT893

The VT893 chassis only supports up to 11 AMCs and with the ordering option B=1, the AMC ports 2 and 3 have interconnections as shown in [Figure 22](#).

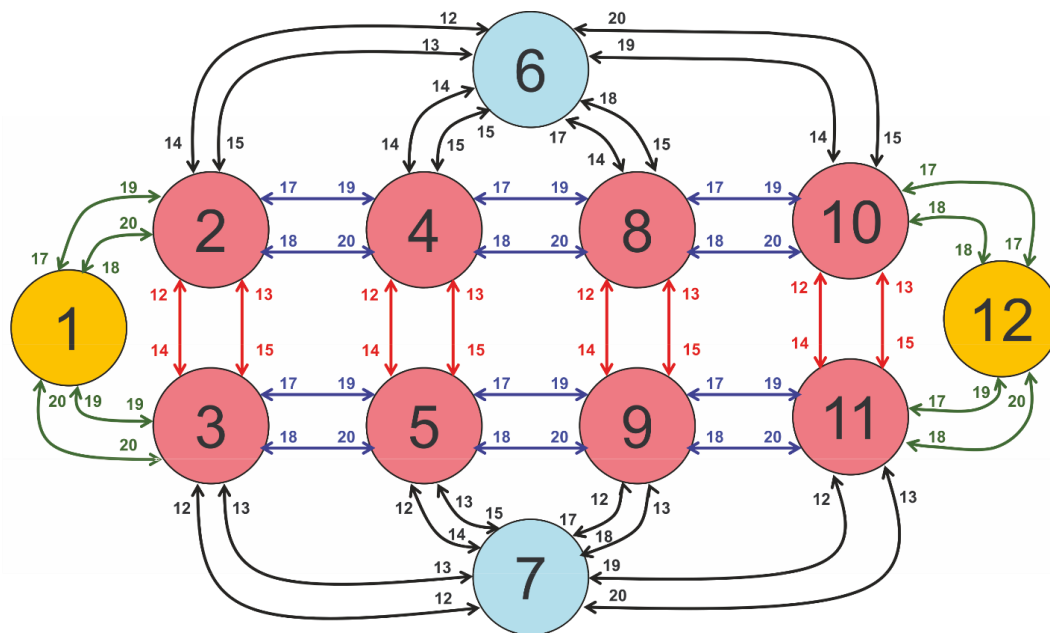
**Figure 22: VT893 Ports 2-3 Direct Connections**



## 5.2 VT894

On the VT894 chassis, the AMC ports 12 to 15 and ports 17 to 20 are interconnected as shown in Figure 23.

Figure 23: VT894 Ports 12-15 and Ports 17-20 Routing



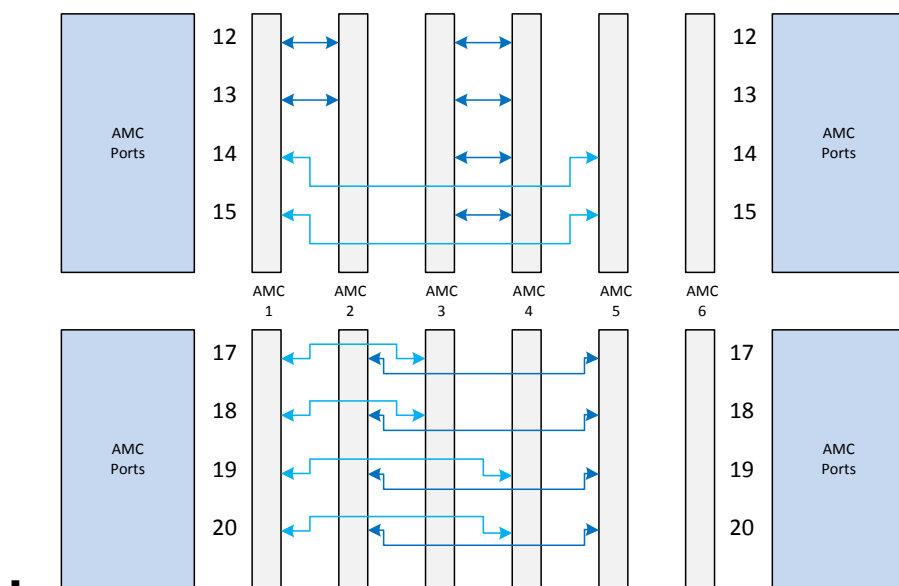
## 5.3 VT899

The summary of differences between VT899 and other VT89x chassis are:

- VT899 only supports single 500 W power supply and single MCH
- VT899 has two Vadatech VT090 Cooling Units
- VT899 has Vadatech DA201 Telco Alarm, instead of DA200
- VT899 only supports up to 6 full-size, single module AMCs
- VT899 can be purchased with a JSM installed (see ordering options in VT899 datasheet). When JSM is installed, Slot AMC6 will not support Full-Height modules as the slot bay shared with JSM.

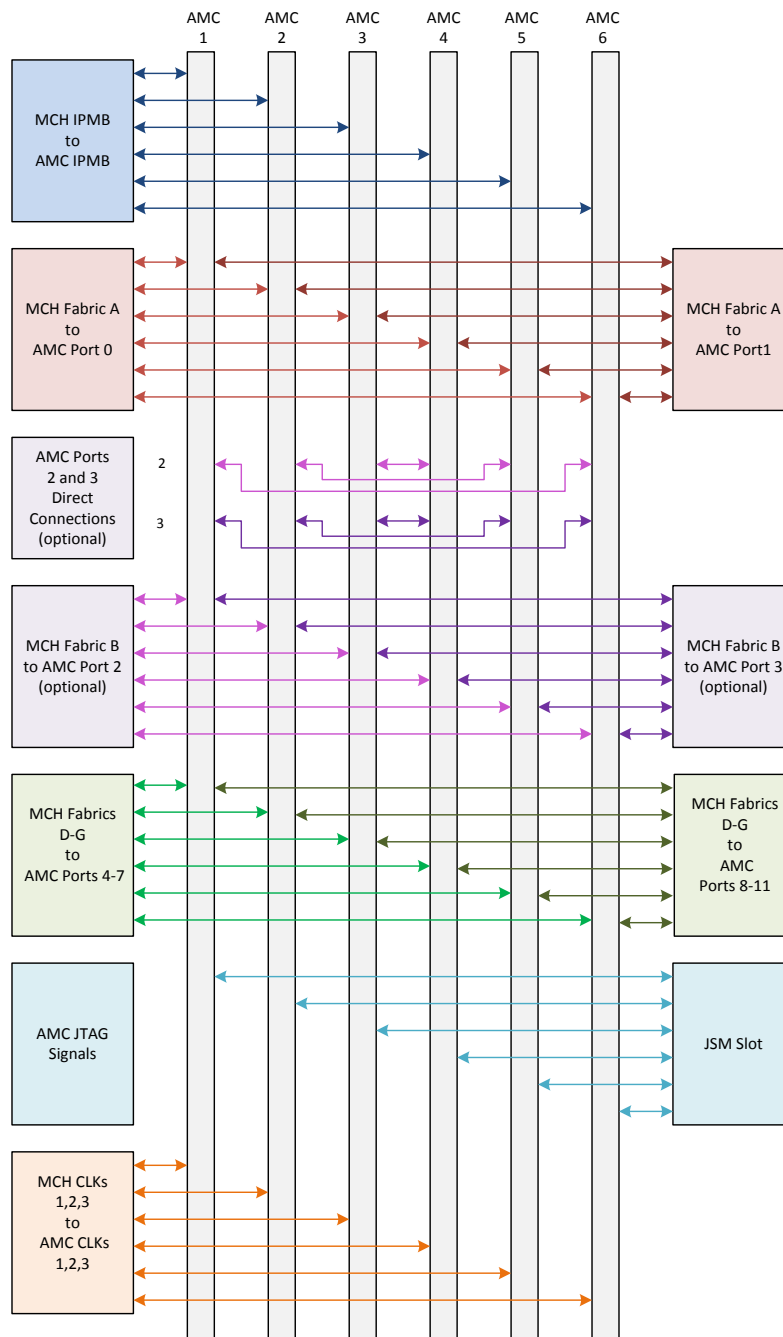
The ports 12-15 and ports 17-20 are routed as shown in [Figure 24](#)**Error! Reference source not found..**

Figure 24: VT899 Ports 12-15 and Ports 17-20



The VT899 backplane topology is shown in Figure 25.

Figure 25: VT899 Backplane Topology



# Notes

## Contact VadaTech

### Technical Support

If you have purchased the VadaTech product through our distributor network, contact your distributor for any technical assistance. If you require further technical support, you can contact VadaTech technical support team by forwarding your support requests to [support@vadatech.com](mailto:support@vadatech.com).

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| 198 N. Gibson Rd<br>Henderson, NV 89014<br>USA<br>Email: <a href="mailto:info@vadatech.com">info@vadatech.com</a><br>Telephone: +1 702 896 3337<br>Fax: +1 702 896 0332 | Ocean Village Innovation Centre,<br>Ocean Way, Ocean Village,<br>Southampton, SO14 3JZ, UK<br>Email: <a href="mailto:info@vadatech.com">info@vadatech.com</a><br>Telephone: +44 2380 381982<br>Fax: +44 2380 381983 | 7th Floor, No 2, Wenhua Street,<br>Neihu District, Taipei 114,<br>Taiwan<br>Email: <a href="mailto:info@vadatech.com">info@vadatech.com</a><br>Telephone: +886 2 2627 7655<br>Fax: +886 2 2627 7792 |

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